Claims

1. A testing device for testing or analysing fluids and comprising

at least one sheet- or plate-like test member (11, 20) including analysis reagent and having opposite side surfaces surrounded by edge portions, and

a separately produced holder (10, 19) having retaining means for receiving and retaining the test member in a predetermined relative position in the holder,

said retaining means comprising an abutment surface (13, 22) engaging with one of said side surfaces of the test member and projections (15, 15a), which are positioned and shaped so as to allow insertion of the test member into the holder by moving the test member into engagement with said abutment surface while engaging with opposite edge portions thereof.

2. A testing device according to claim 1, wherein the projections (15) are tooth-shaped with pointed ends.

3. A testing device according to claim 1, wherein each of at least some of the projections (15) has a leading edge (16) forming a ramp sloping towards a plane defined by the abutment surface so as to facilitate insertion of the test member into the holder.

4. A testing device according to claim 1, wherein each of at least some of the projections (15) has a trailing edge or surface (17) extending substantially parallel with and spaced from a plane defined by the abutment surface.

5. A testing device according to claim 1, wherein the projections are positioned so as to be differently spaced from the plane defined by the abutment surface.

6. A testing device according to claim 1, wherein the holder (19) is a channel-shaped member having an inner bottom surface (22) defining said abutment

surface and opposite inner side surfaces (21) from which projections (15) extend in opposite directions.

7. A testing device according to claim 1, wherein the test member (20) is an elongated member of the "lateral flow stick" type, in which the fluid to be tested is supplied at one end (24) of the elongated test member.

8. A testing device according to claim 1, wherein the holder (10) is frame-shaped and defines an opening (14) therein, the abutment surface (13) extending around and adjacent to said opening.

9. A testing device according to claim 1, wherein the holder (10, 19) has upper and lower complementary surfaces so as to allow stacking of a plurality of testing devices on top of each other.

10. A testing device according to claim 9, wherein said complementary surfaces are shaped so as to allow mutual displacement of stacked testing devices in a direction transversely to the longitudinal direction of the stack.

11. A testing device according to claim 1 for use in colorimetric testing of milk.

12. A holder for a testing device according to claim 1, said holder (10, 19) comprising means for receiving and retaining a sheet- or plate-like test member (11, 20), which has opposite side surfaces surrounded by edge portions, in a predetermined relative position in the holder, said retaining means comprising an abutment surface (13,22) for engaging with one of said side surfaces of the test member and projections (15, 15a), which are positioned and shaped so as to allow insertion of the test member into the holder by moving the test member into engagement with said abutment surface while engaging with opposite edge portions thereof.

13. A holder according to claim 12, wherein the projections (15) are tooth-shaped with pointed ends.

14. A holder according to claim 12, wherein each of at least some of the projections has a leading edge (16) forming a ramp sloping towards a plane defined by the abutment surface so as to facilitate insertion of the test member into the holder.

15. A holder according to claim 12, wherein each of at least some of the projections has a trailing edge or surface (17) extending substantially parallel with and spaced from a plane defined by the abutment surface.

16. A holder according to claim 12, wherein the projections are positioned so as to be differently spaced from the plane defined by the abutment surface.

17. A holder according to claim 12, wherein the holder is a channel-shaped member (19) having an inner bottom surface (22) defining said abutment surface and opposite inner side surfaces (21) from which projections (15, 15a) extend in opposite directions.

18. A holder according to claim 12, wherein the holder (10) is frame-shaped and defines an opening (14) therein, the abutment surface (13) extending around and adjacent to said opening.

19. A holder according to claim 12, wherein the holder has upper and lower complementary surfaces so as to allow stacking of a plurality of holders on top of each other.

20. A holder according to claim 19, wherein said complementary surfaces are shaped so as to allow mutual displacement of stacked holders in a direction transversely to the longitudinal axis of the stack.

21. A holder according to claim 12, wherein the holder has been integrally formed.

22. A testing device according to claim 1, wherein the holder further comprises an upper side and a lower side in relation to an analysis instrument,

and wherein the retaining means are positioned and shaped so as to allow insertion of the test member in to the holder from the upper side.

23. A holder according to claim 12, wherein the holder further comprises an upper side and a lower side in relation to an analysis instrument, and wherein the retaining means are positioned and shaped so as to allow insertion of the test member in to the holder from the upper side.

24. A cartridge for receiving, storing and unloading a plurality of stacked testing devices, the cartridge comprising:

- a housing defining an internal passage for said stack of sticks, said housing comprising:
- a lower charge opening for receiving said stack of testing devices,
- a support member for supporting a lower testing device in said stack,
- an upper abutment surface for engaging with an upper testing device in the stack, and
- an upper discharge opening, substantially aligned with said upper testing device, so as to allow discharge of said upper testing device by displacing the same along said abutment surface.

25. A cartridge according to claim 24, wherein the housing is assembled by two halves, together defining oppositely side surfaces, and a front and a back surface.

26 A cartridge according to claim 25, wherein the two halves are detachable or non-detachable assembled.

27. A cartridge according to claim 24, wherein at least the discharge opening comprises guiding trails or incisions for guiding a testing device upon discharging.

28. A cartridge according to claim 24, wherein the side surfaces comprise guiding trails for guiding said stack of testing devices through the passage.

29. A cartridge according to claim 25, wherein the side surfaces further comprise at least one serrated track on the inside, forming one side of an internal one-way stair for a support member.

30. A cartridge according to claim 24, where in the support member is movable in relation to the housing.

31. A cartridge according to claim 24, further comprising one-way means associated with the movable support member allowing the movable support member to move in a direction towards the upper abutment surface, only.

32. A cartridge according to claim 31, wherein said one-way means comprise at least one succession of teeth, such as a rack or ratchet teeth, and at least one pawl member co-operating therewith.

33. A cartridge according to claim 24, comprising at least two pawl members, which are connected to the supporting member for co-operating with a succession of teeth formed on an inner side surface of the storage container, the free ends of the pawl members being spaced in the longitudinal direction of the container by a distance being different from a multiple of the pitch of the succession of teeth, preferably smaller than said pitch.

34. A cartridge according to claim 25, wherein at least one of the side surfaces further comprises a locking device in the vicinity of the discharge opening, for preventing unintentional discharges of testing devices.

35. A cartridge according to claim 34, wherein the locking device comprises at least one flexible protrusion obstructing at least a part of said discharge opening.

36. A cartridge according to claim 24, further comprising an external protrusion for abutting a support surface on a storage carousel in an analysis instrument.

37. A load device for loading a stack of testing devices into a cartridge, the load device comprising:
- a base member,
- a first and a second column oppositely arranged and extending upwards from said base member, and being adapted to receive and hold one or more testing devices there between, and
- a lifting device for slidably lifting one of more testing devices along said columns.

38. A load device according to claim 37, wherein each column comprises a groove for receiving and guiding an end of a test stick.

39. A load device according to claim 37, wherein the lifting device comprises a handle for manually sliding said lifting device along said columns.

40. A load device according to claim 37, wherein the lifting device is automatically slid along said columns.

41. A load device according to claim 37, wherein the lifting device further comprises a support surface for supporting at least a part of the lower testing device in said stack of testing devices.

42. A load device according to claims 41, wherein the stack of sticks are loaded into a cartridge according to claim 24 and wherein the support member of said cartridge is arranged between said support surface of said lifting device and the lower most testing device in said stack.

43. A load device according to claim 37, wherein the lifting device further comprises guiding means abutting a side portion of said columns so as to guide the device along the columns.

44. A method for loading a plurality of testing devices into a cartridge by using a load device, the load device comprising:
- a base member,

- a first and a second column oppositely arranged and extending upwards from said base member, and being adapted to receive and hold one or more testing devices there between, and
- a lifting device for slidably lifting one of more testing devices along said columns,

the method comprising the steps of:

-stacking one or more testing devices between the columns,

-guide an empty cartridge from above the columns and down towards the base member,

-lifting the lifting device in order to push the sticks upwards until the upper most testing device abuts an upper abutment surface of said cartridge,

-removing the cartridge loaded with the sticks from said load device.

45. A method according to claim 44, further comprising, prior to the step of placing testing devices, the step of placing a support member between the columns for supporting and holding the stack of testing devices inside said cartridge upon removing the loaded cartridge.